



PAGE: Helping Manage Madagascar's Environment For Economic Growth



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Our Vision

The importance of Madagascar as a biodiversity "hotspot" is unquestioned by evolutionary biologists. The diversity of habitats on this island continent present such manifold and unique evolutionary oddities that scientists could be occupied for decades in trying to unravel their mysteries. The US Government, via the US Agency for International Development (USAID), has contributed significantly since the early 1990s towards supporting improved management of these environmental resources. But USAID's ultimate development assistance goal is to "reduce poverty", not to conserve biodiversity for its own sake. For USAID, biodiversity conservation is thus a means to an end.

The Environmental Management Support Project (PAGE) -- a project implemented by International Resources Group, Ltd. of Washington, DC -- adheres to the same logic embedded in USAID's ordering of objectives: that improving resource management is a necessary step to addressing problems of poverty and economic growth for the country.

Our first project action plan, completed in November, 1999, reflected that focus when we wrote: "the only way in which sustainable environmental management, including biodiversity conservation, will have a future in Madagascar, is if revenue from the environment can contribute a significant amount to the national, regional and local economies."

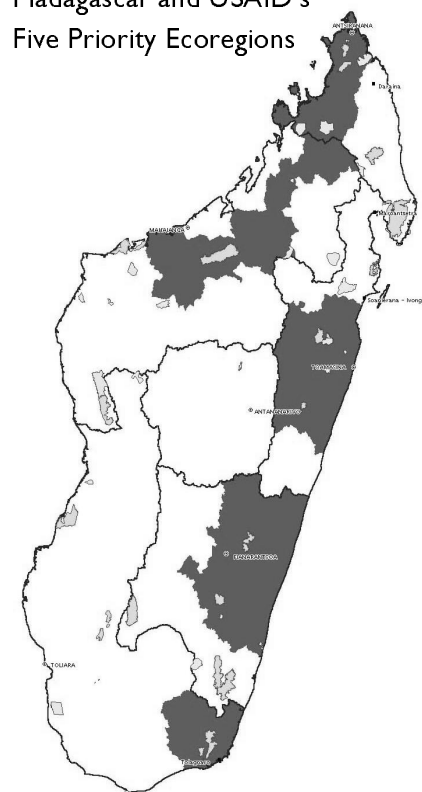
The PAGE team faces enormous challenges in trying to realize our vision. As per our contract, we are to help put in place the "enabling conditions for establishing sustainable organizations and policies" in the environmental arena. To that end, our work has focused primarily on four primary components: sustainable financing of environmental activities; environmental policy; environmental impact assessment; and, ecological monitoring. We have worked with and for the public agencies responsible for implementing the country's National Environmental Action Plan (NEAP), as well as with private sector businessmen and consultants, NGOs, and Provincial and local government.

To each of these technical areas of our project we have tried to deepen the understanding of partners about the importance of the environment to economic growth. Until and unless key Malagasy decision-makers endorse this contribution of biodiversity management to economic growth, the country's Environment Program (EP) -- the funding program designed to implement the NEAP -- risks being set apart, as the Malagasy often say, as a program to protect the lemurs rather than help the poor.

Given this focus on the economy and on poverty, PAGE launched a comprehensive effort to quantify the economic value of a range of environmental goods and services in early 2000. This "environmental economic case studies" program, now completed, used accepted statistical and economic tools to measure the link between biodiversity management, economic growth and poverty reduction, and made it clear that the loss of environmental resources such as forests and soils results in real economic losses to the poorest and most marginalized members of society.

Learning from such results, we have maintained an emphasis throughout our project on those activities that have the most direct contributions to economic growth. Consider these examples:

Madagascar and USAID's
Five Priority Ecoregions



Protected Areas Trust Fund and Marketing of the National Park Service (ANGAP): We have worked with public and private entities to begin putting a Trust Fund in place to facilitate more direct international financing of the country's protected areas network over the coming decades. As a complement, our work to develop and market the image of the National Park Service (ANGAP) helps build a sense of value for potential investors. Our goal has been to work with partners like WWF to ensure that the National Park Service has all the conditions in place to encourage investment by international private and public investors.

Carbon Offsets: PAGE is working with the Government to help put in place a clearing-house for carbon offset investment projects, and is nearing completion of a initial package via which international investors will be able to invest in carbon offset credits in the biodiversity-rich forests of the Makira Plateau.

Environmental Impact Assessment (EIA): PAGE's work on environmental impact assessment takes as a starting point the urgency of making private and public sector investment at the same time more streamlined and cleaner. If natural resources are over-consumed, or if investment leads to excessive pollution, then economic growth is likely to slow and people will suffer from lack of access to resources and an unclear environment.

Forest Governance: Our forest governance program helps to ensure that Malagasy citizens understand the economic and other benefits they are entitled to receive from forests, and the responsibilities they have in protecting them. Local people understand that forests are critical to their survival, but when they feel powerless, they have little incentive to manage forests well for the future.

Ecological Monitoring and the Role of "Watchdog": The country's biodiversity capital is an asset requiring stewardship if long-run economic growth is to be sustained. The ecological monitoring component of PAGE develops and tracks key biodiversity indicators and trends that reveal whether current investment patterns create conditions adverse to conservation of biodiversity.

PAGE does not work alone but as a technical and financial support to the participants in the country's EP. In addition to our partners in the EP, PAGE has worked with, and benefited from, close working partnerships with the World Wide Fund for Nature (WWF), the Wildlife Conservation Society (WCS), Conservation International (CI), Participating Agencies Cooperating Together (PACT) and Chemonic's Landscape Development Interventions (LDI) Project, among others.

In the remainder of this document, we review some of the areas in which PAGE has been able to make an important contribution to improved environmental management in Madagascar since our inception in mid-1999. Taken together, the contributions listed here represent an important step in creating the conditions for a sound, viable and lasting economic growth strategy for the country.



A major challenge facing Madagascar is ensuring that the financial requirements for managing its environment and natural resource base are assured beyond the end of external project assistance. To date most environmental activities in Madagascar are coordinated under the banner of the second Environment Program, or EP2, the current phase of the 15-year National Environmental Action Plan. An examination of the EP2 budgets provides a clear-cut example of the enormity of the sustainable financing challenge. International project funds pay close to one hundred percent of investment and training budgets and nearly seventy percent of the operating budgets of three of the country's principal environmental organizations: the National Park Service (ANGAP), the National Office of the Environment (ONE), and the National Association for Environmental Actions. This is untenable. Each of these agencies must develop a strategy to better align its mandate and its level of personnel and costs with its potential long-term funding sources, or it will not survive after the withdrawal of external financing.

The financing problem also extends to the Ministry of the Environment and that of Water and Forests. Both ministries are attempting to manage mandates with grossly inadequate budgets. In the case of the Ministry of Water and Forests, the successful implementation of the new forest policy, which promotes a greater role for local communities and the private sector, will require financial resources well beyond those currently available.

Support to a Sustainable Financing Commission: The Government of Madagascar and the international community agree that major steps must be taken now to guarantee that an advanced degree of financial autonomy be attained by the end of the third phase of the Environment Program in 2007. In July 2000, a Sustainable Financing Commission was created to address this issue. The Commission members include representatives of the major public agencies involved in environmental management, two international conservation NGOs, as well as the Ministry of Finance and the Central Bank. The Commission's main task is to propose to Government a financing strategy for the EP3 and beyond. The Commission's strategy is to manage a gradual shift away from external project assistance in favor of internally managed funds.



PAGE is studying options to adding a "green tax" for each tourist.

PAGE's sustainable financing team provides support to both the Sustainable Financing Commission and to several of the potential financing innovations that the Commission has identified. In its role of Secretariat to the Commission, PAGE endeavors to expose its members to the key technical issues they need to consider when analyzing the feasibility of various instruments. To this end, PAGE organized a study tour of Commission members in April 2001 to Brazil, Costa Rica, Mexico and Washington, DC. The Commission developed its overall strategy for sustainable financing during that study tour. More recently, the Commission requested the PAGE team to prepare the draft financing strategy document for the third phase of the EP, or EP3.

Carbon Sequestration and Financing: In terms of mobilization of new long-term funding, PAGE support focuses on the development of a trust fund for protected areas and on testing the potential to attract investments from carbon sequestration activities. See the following pages for more information on our experience with these two activities.

Business and Marketing Plan for a National Park Service: One of PAGE's primary activities -- executed in close collaboration with WWF under another USAID-funded project -- is its support to the National Park Service to develop a business plan and marketing strategy. PAGE will assist in defining and initiating the implementation plan for these strategies. See following pages for more details.

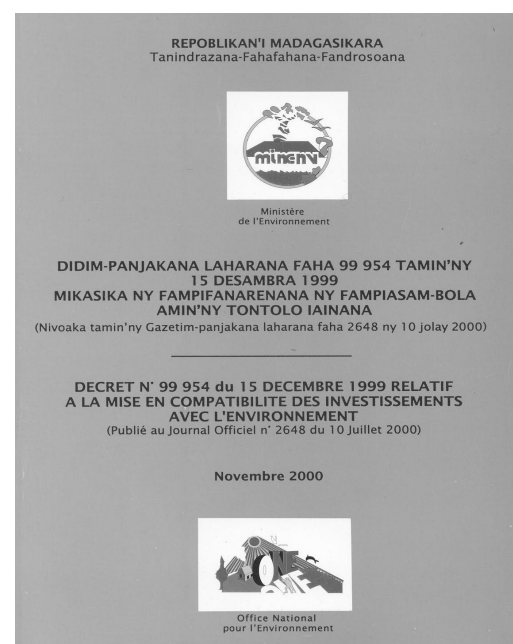
Analysis of a Green Tax: Another potential source of funding is a green tax. Tourism has become one of the major products Madagascar offers to the world and much of Madagascar's tourism focuses on visiting parks, reserves and coral reefs. A recent study Commissioned by PAGE suggests that tourists are willing to pay twice as much as current levels for entry into parks. However, even with a doubling of entry fees, the absolute number of tourists is still small compared to global levels. The short-term net effect of higher entry fees will therefore be small. As a complement to revising entry fees, and to capture people's total willingness to pay, PAGE and the Ministry of Environment are analyzing the potential of a modest surcharge for all travelers coming to Madagascar. Even a modest fee of \$5 per traveler would generate some \$2 million per year to finance environmental activities.

Options for Petroleum Tax: PAGE's work is not limited to mobilizing new funds but includes assistance to improve the performance of two existing financing windows. The first is a petroleum tax for the environment. The tax proceeds, estimated at around \$300,000 per year, are deposited into an account managed by the Ministry of the Environment. Yet no guidelines exist to direct the use or management of the funds collected. PAGE supports the Ministry to establish criteria for the use of the funds and to define an appropriate structure for transparent fund management, including procedures on disclosure.

Options for the MECIE Fund: PAGE is also collaborating with the National Environment Office (ONE) to improve the cost-recovery of its environmental impact assessment (EIA) review fund. The law stipulates that investors submitting EIAs must pay a fee to ONE to meet the costs of EIA review. In theory, the fee covers the costs of the EIA review and related institutional expenses. In practice, project funds cover many of the operational costs for reviewing EIAs. PAGE is now focused on preparing new guidelines for the transparent management of the EIA fund as well as recommendations on how to better align the costs and fees associated with the EIA review process.

Improvements to Cost Management: With respect to cost management, PAGE is assisting in updating the financial management systems and operational procedures at ANGAP and the ONE. A significant gap exists between the current policies and tools available within these agencies and the systems and competencies required to exploit those tools.

PAGE is working with both institutions to clarify and standardize internal financial and accounting procedures. These steps will allow the two organizations to better track their costs and to implement long-term cost control strategies. Once the systems are clearly defined, training will be organized at all levels of the institution.



PAGE is working to improve the financial sustainability of the fund created by this MECIE Decree.

For more information, contact Andy Keck or Abraham Elison

Marketing and Business Planning in a National Park Service

The challenges to the country's National Park Service (ANGAP) are daunting. Budgets allocated by the Government are grossly insufficient to cover costs, so the institution's survival depends in an important measure on appealing to other donors and investors, including bilateral and

multilateral funding programs, private international foundations, and others. While park systems in other wealthier countries may have the luxury of focusing on park management, ANGAP must allocate significant attention and resources to such complex issues as donor relations, image management, and communications.



ANGAP's new logo, developed with technical leadership of PAGE.

PAGE has been working in close association with the World Wide Fund for Nature (WWF) to support ANGAP in its efforts to become financially self-supporting. ANGAP has set an ambitious roadmap for its improvement, which includes four broad elements: (1) revision of its legal framework; (2) establishment of a park network plan; (3) restructuring of the organization; (4) and development of a marketing and a business plan.

The focus of the PAGE team has been on financial issues. Overall, PAGE's objective is to help ANGAP to establish its reputation as an internationally recognized leader in protected area management, and then to use that reputation to generate long-term financing for the protected areas network.

PAGE's financial advisory services to ANGAP have touched upon three areas:

- (1) Initial establishment of key image elements, including logo and brochure
- (2) Support to development of a marketing plan and a plan for long-term financial sustainability
- (3) Improved internal financial management

One of PAGE's first priorities at the beginning of the project was to make quick progress in changing the image of ANGAP, and one of the first steps in that direction was development of a new logo. The new logo is now used throughout ANGAP, and is available in media ranging from letterhead to car stickers to shirts and hats. The logo projects an institution that is thoroughly modern and up-to-date, but still focused on its primary core value: conservation of Madagascar's natural heritage.

With the logo completed, attention has shifted to a second core image problem: ANGAP does not have an acceptable presentation document to distribute to decision-makers at international meetings (or locally, for that matter). It has needed a single document that explains ANGAP's mission, how it is going to achieve it, and how investors can help. PAGE is now engaged -- with active financial and technical participation from WWF -- in working with ANGAP to develop this brochure. The brochure's main objectives will be to convince the reader that ANGAP is an important actor in the protection of the world's biodiversity and that it is necessary to take

immediate actions to save such a treasure. The brochure also suggests that ANGAP has serious programs designed around a precise and well defined 20-year vision and that ANGAP is improving its management system. The brochure should be available in March 2002.

PAGE has been working with ANGAP to focus on a future in which the Environment Program (EP) and major funding programs such as USAID's will end, and there may be few such comprehensive funding sources to take their place. To this end, PAGE is working with ANGAP to develop two closely related tools by February 2002. The first, an institutional marketing plan, will define the strategies to be developed in order to improve park operations and to find international financing. The second, a plan for long-term sustainability, will define the framework for a long-term vision and will reflect the evolution and the positioning of the organization, its future financial needs, its products and services, and the proposed financing plan. PAGE, working with its partners at WWF, will provide consultants who will facilitate the whole process. This participative approach is crucial if the organization is to internalize the plans, and therefore use them in the long-term.

The third broad area of PAGE support to ANGAP has been in internal financial management. It is not surprising given ANGAP status as an executing agency within the EP that its financial management system was structured to respond as a temporary project rather than a permanent institution. As donors and priorities have evolved, and the demands on the system have changed, ANGAP has realized that it needs to formalize its procedures and reduce the need for modifications due to project demands. To this end, ANGAP requested that PAGE assist in the development of financial and administrative procedure manuals. The financial manual, where PAGE is now placing the

greatest effort, is necessary so that ANGAP can: (1) improve its financial management system, and in the process, formalize the decentralization of power; (2) formulate financial strategies according to standard approaches; (3) optimize human resources by adhering to the established organizational structure; and (4) adopt an operational mode resembling that of the private sector.



Isalo National Park, like many of Madagascar's parks, is striking for its natural splendor. Photo Conservation International.

As PAGE nears its end, we are working closely with other partners supporting ANGAP -- especially WWF -- and pulling back into a secondary support role. But the goal of our efforts for ANGAP remains the same: in applying private sector business concepts to ANGAP, we hope to ensure that potential investors in the system perceive its enormous value, and are willing to invest in ANGAP's role in ensuring the conservation of Madagascar's biodiversity as an international heritage.

For more information, contact Abraham Elison or Holisoa Rasamoelina

Towards Establishment of a Protected Areas Trust Fund

Madagascar's National Park Service (ANGAP) is responsible for the management of some 17,210 km² of territory divided across 44 national parks and reserves, which contain the great majority of the remarkable biodiversity of the country. The area under ANGAP management will increase in coming years as it strives to meet its mission of protecting representative ecosystems.

Since most of Madagascar's protected areas are in remote regions with limited access, management of the network comes at a significant cost. ANGAP's annual operating budget averages around \$5 million. Although some protected areas attract international and national tourists, ANGAP's direct revenues from parks in Madagascar are quite small, now running at some \$200,000 per year. However, numerous studies confirm that the primary motivation of most international tourists visiting Madagascar is to see the country's biodiversity in its natural habitat. Although tourism generates an estimated \$126 million in foreign exchange, Madagascar remains a poor country and has limited capacity to contribute to the funding of environmental protection.

The bulk of funding for protected areas comes from the international donor community. Donor funds cover around 65% of running costs and nearly 100% of investment costs at ANGAP. Such project-based financing is clearly not an appropriate long-term mechanism for ensuring park management costs. The Government and the donor community have long agreed on the need to implement a strategy to replace project-based funds with a more self-sustaining financing system for the parks network.

A major element of the strategy for greater financial autonomy is the creation of a Protected Areas Trust Fund. Trust Funds represent a relatively flexible approach for channeling donations via a permanent endowment to park management activities. If successful, a Trust Fund can attract substantial contributions from both traditional donors as well as private sector donors. PAGE, in cooperation with Conservation International (CI) and the World Wide Fund for Nature (WWF), has assumed a lead role in mobilizing technical assistance to guide the Government through the complexities of establishing such a fund.



PAGE endeavors to create a trust fund for the long-term financing of Madagascar's park system. Photo Rafiadana Ntsoa S., WWF.

The idea of a trust fund gained momentum in July 2000 during a PAGE-sponsored workshop in Antananarivo on sustainable financing mechanisms for the environment. The event allowed representatives of the major environmental organizations (public and private) in Madagascar to learn about various approaches to funding conservation, including trust funds, concessions, green taxes, and carbon sequestration. The workshop participants proposed creation of a national Sustainable Finance Commission to act as a focal point on identifying and assessing new financing mechanisms appropriate for Madagascar.

The Commission determined early on that a trust fund had high potential and that there was a need for the members to learn more about how biodiversity-related trust funds operate. PAGE mobilized a trust fund expert to undertake an initial feasibility analysis. Through work with the trust fund expert, the Commission members learned about some of the key criteria that have led to the success of certain trust funds around the world, such as defining clear objectives, ensuring good governance and transparent financial management.



PAGE has collaborated closely with Conservation International and the World Wide Fund for Nature (WWF) on the Trust Fund development.

To better understand the “how-to” of designing and managing a trust fund, the PAGE-organized study tour in April 2001 to Costa Rica, Mexico and Washington, DC, was an important step. In Costa Rica, the participants met with representatives of the park service as well as with directors of a half dozen foundations that channel money to the country’s protected areas network. In Mexico, the participants were exposed to the structure and functions of the Mexican Foundation for the Conservation of Nature.

In Washington, DC, the group met representatives of donor agencies and international NGOs to study other applications of financing instruments around the world. The Minister of the Environment joined the group in Washington to participate in an assessment of financing options. The PAGE sustainable finance team led the group through a feasibility analysis of the various potential financing instruments. The Commission’s experience in Costa Rica, Mexico, and Washington, DC, led them to the conclusion that the trust fund’s probability of success would be highest if it initially focused on the considerable needs of ANGAP and the protected areas network.

It has been clear from the beginning that any trust fund for biodiversity would require the political and financial support of the Government of Madagascar. Indeed, international donors, private and public, will typically look at the contribution of the Government as one criterion for giving. The Commission prepared a brief technical note providing justification of the need for a trust fund and proposing next steps. The note called for the creation of a Trust Fund Steering Committee and recommended that the Government meet its contribution through an allocation of a portion of the public funds freed up through an on-going debt reduction initiative with the international community. The Minister of the Environment and the Prime Minister’s office gave their approval in principle to these proposals, thus paving the way for the creation of a trust fund steering committee. It was also agreed that \$200,000 in existing GEF project funds to ANGAP be allocated in support of the steering committee to undertake the necessary technical analyses for creating the trust fund.

The current projection is that the Fund’s management structure will be created by June 2002. Throughout the process PAGE, CI and WWF have worked closely to support this initiative. With the Trust Fund Steering Committee now in place and start-up funding identified, PAGE has pulled back from the activity. Its partners, WWF and CI are assuming a more important role in assisting the Government to structure the trust fund and to raise the initial contributions to the fund’s endowment. The Madagascar experience demonstrates that the creation of a new trust fund is a very long process requiring substantial consensus building on the objectives and concepts before proceeding to the technical design and fund-raising stages. It is likely that it will be another year before the fund receives its first contribution.

For more information, contact Andrew Keck

Carbon Sequestration and Revenue Generation under the Kyoto Protocol

The biodiversity benefit of forests has already served as a major impetus to mobilizing traditional donor investment for Madagascar's environment. In addition to their benefit in holding biodiversity, those same forests also serve as a storing house for carbon. Ensuring that this carbon remains in the forests, rather than being released into the atmosphere, is of considerable importance to the world community. The Framework Convention on Climate Change and the subsequent Kyoto Protocol are international legal agreements that seek to create, among other things, a means for buying and selling carbon. Although the terms of such carbon trading have not yet been finalized, it is now clear that forests' ability to store carbon is a service for which investors will be willing to pay.

In light of this value of forests as carbon storehouses, the Ministry of Water and Forests and PAGE have initiated a pilot project to test the potential for mobilizing new funds for forest protection in exchange for credits in avoided carbon emissions. The carbon emissions result from the loss of natural forest to slash and burn agriculture and production of wood fuels. The project area is a block of more than 200,000 hectares of rain forest located to the west and north of the coastal town of Maroantsetra. It includes three classified forests and a significant piece of unclassified forest. The pilot zone, dubbed the Makira because of the prominent plateau at its core, was selected for its potential as a critical habitat and corridor for biodiversity, the likelihood of high stores of biomass, and the significant risk of large-scale forest loss and fragmentation over the next twenty years.

The forests in question are state owned but are not part of the protected areas network. The Ministry of Water and Forests does not have the financial means to guarantee the integrity of the area, despite its status as one of the last remaining large blocks of unprotected forest in the country. Although quite large, the forests are under pressure from local communities. Data collected to date suggests that if left unmanaged, the Makira will undergo an exponential rate of loss over the next twenty years.

Although the Ministry of Water and Forests had demonstrated an interest in testing innovative tools for financing forest conservation, technical understanding of the particularities of carbon sequestration project design was limited at the time PAGE starting working on carbon sequestration. The key first step in PAGE's support was to ensure that the Ministry staff fully understood the political and technical implications of the carbon sequestration idea. PAGE



PAGE organized in July 2001 to explain the Climate Change Convention, the Kyoto Protocol and the Clean Development Mechanism.

invested considerable time in discussing the concepts of carbon sequestration with the Director General and an internal steering committee. One staff member participated in a study tour to Costa Rica and Washington, DC in April 2001 during which he met with individuals who had designed carbon sequestration projects in several countries. In order to broaden the support for the pilot project with the Ministry of Water and Forest's key partners, PAGE also organized a one-day workshop in July to explain the Climate Change Convention, the Kyoto Protocol and the Clean Development Mechanism, all three being key to the formalization of carbon offset credits.

Once the Ministry gained a better understanding of carbon sequestration projects, a technical team was employed to help collect the necessary data and prepare baseline calculations for the project. The Makira forests are also among the least studied and explored in Madagascar. Two over flights of the region were conducted in July and August to ascertain the state of forest cover and to gain a better idea of the damages inflicted in April 2000 by the cyclone Hudah. The over flights were complemented by a brief field trip to the region. A preliminary analysis of satellite images has suggested that deforestation rates along the periphery of the Makira may be as high as three percent per year.



Makira plateau, proposed site for carbon sequestration pilot project.

In August, PAGE and Ministry of Water and Forests used the feasibility assessment to make three key decisions. First, that much of the Makira forest should be zoned as a conservation area. To this end, provincial governments and local governments should be involved in determining the appropriate management structure for the designated conservation zone. Second, that a comprehensive strategy must be developed to seek alternatives to slash and burn agriculture. Without such a strategy, “leakage” of carbon, due to accelerated deforestation outside the project area, would undermine the technical and financial viability of the activity. And third, that a clear institutional framework must be identified for implementing the project. Potential investors in carbon offsets look for a demonstrated scientific and management capacity in team proposed as managers of the site and activity.

In order to move the project into the next stage, PAGE advised the Ministry of Water and Forests to bring the Wildlife Conservation Society (WCS) into the project design process. WCS is already responsible for managing the largest protected area in Madagascar near the Makira and is recognized internationally as a highly competent science-based conservation organization. The Ministry of Water and Forests-WCS partnership is now firmly established and PAGE now considers them both as clients.

Due to the uncertainties as to whether conservation-based carbon credits will be eligible under the Kyoto Protocol, the Ministry of Water and Forests-WCS-PAGE team has decided to move the project forward in stages. PAGE is finalizing a funding and technical proposal to implement comprehensive field studies in the Makira in 2002 in order to establish the project’s overall baseline. Fieldwork will include flora and fauna inventories, biomass assessments to determine carbon sequestration levels (including stratification of the forest according to biomass levels), additional remote-sensing analysis of deforestation and ground-truthing of those analyses, and socio-economic assessments of households and villages living on the forest perimeter. Although PAGE will provide technical support to this activity through February 2002, it is foreseen that implementation of the next phase will be managed jointly by Ministry of Water and Forests and the WCS.

For more information, contact Andy Keck

Policy development is a pre-requisite to the success of any large-scale development program, in great measure because setting policy is all about setting and justifying clear directions. Without a clear direction and purpose, any program becomes diffuse and marginally effective. To date in Madagascar, the clarity of policy directions coming from leading national environmental institutions has been irregular. Outside government, environmental constituencies have to date played only a marginal role in participating in the debate and influencing governmental policy and action.

PAGE has made an effort to ensure that environmental decision-makers play a leading role in setting a clear direction for the sector. At the Ministry of the Environment -- which was underfunded in light of its official mandate when PAGE began -- we have provided support in a number of areas, with a focus on strategic planning and institutional strengthening. In the forestry sector, we have worked on the one hand with stimulating civil society to play a more vigorous role while working with the Ministry of Water and Forests to help set a new agenda for change. The following paragraphs and pages give a flavor of what PAGE has been able to do in supporting development of a clearer and more efficient environmental policy context at the national and regional levels.

Policy Advice and Institutional Strengthening at the Ministry of the Environment: PAGE's initial and immediate priority after the project began was to assist the Ministry of Environment to engage in a reform process in support of its overall mandate. While the Ministry was at the apex of organizational diagrams of the Environment Program (EP), it was not at the time fulfilling its role as a leader. We have thus worked to assist in establishing the Ministry's orientation, clarify its goals and objectives, set priorities and develop a concrete plan of activities linked to its available resources. We believe that the Ministry of the Environment, as the lead actor of the Government in the environment area, must be in a position to play a key role for the remainder of EP2 and to play a leadership role in the EP's 3rd phase. To this end also, we have worked to establish more clearly a functional working relationships between the Ministry and the policy-making arm of the National Environment Office.



Training of Environment Units from sectoral ministries.

Quantifying and Communicating the Economic Value of the Environment: Developing appropriate policies requires a detailed understanding of the tradeoffs between different choices. One important criterion in comparing options is economic costs and benefits. PAGE's environmental economics case study program, recently completed, has generated quantified estimates of contributions of select environmental goods and services to Malagasy households and the Malagasy economy. Such analytical work is now being used to develop new policies. For more information, see the following pages.

Strategic Planning Support to the Ministry of the Environment: In order to achieve the objective of helping the Ministry of the Environment clarify its mission, PAGE has provided support in strategic planning. An initial draft strategy that was outlined during small group sessions with the Minister and his senior staff in mid-2000 is now being used as a core concept piece for building the Ministry team identity. Team-building exercises have been undertaken by the Ministry, with

support from PAGE, using the draft strategy as a core document. The draft strategy was also used as a discussion document with the Directors of other agencies executing the EP. In upcoming months, it will be used to facilitate dialogue with the private sector, the public and the Provinces. For a more complete discussion of this work, see the following pages.

Decentralization and De-concentration of Environmental Roles and Responsibilities:

Adoption of the Law on Autonomous Provinces has given new impetus to the decentralization and de-concentration of environmental authority in the country. PAGE has provided advice to the Ministry of the Environment in the establishment of its regional offices, in part by assisting regional Directors in establishing their role and responsibilities. More recently, we have undertaken a legal and institutional analysis of how environmental roles and responsibilities are likely to be affected by creation of the new Provinces.



Members of the Tamatave Steering Committee discuss decentralized environmental roles.

Incorporating Environmental Issues at the Commune, Eco-Regional and Provincial Levels: PAGE has undertaken technical efforts to include environmental considerations at three different local planning levels. With Communes (roughly equivalent to county or town government), we have financed development planning in the eight Communes surrounding the QMM ilmenite mine in the Anosy Region. In each of these communes, the National Environment Office (ONE) helped communes through a process of identifying development priorities, while taking into account environmental issues. At a higher level, we have provided the Regional Development Committee (CRD) of the Anosy Region with a grant to develop a Regional Development Plan, assuring that their process included participation from a wide variety of actors. As a complement to our support to the CRD, PAGE's Ecological Monitoring team led a technical process of identifying regional biodiversity conservation priorities in Anosy (see section below on "Biodiversity Priority-Setting"). Finally, we are working -- in collaboration with the ONE and PACT -- in the Autonomous Province of Tamatave to assist it in setting regional environmental priorities.

Forest Governance: In December of 1999, USAID challenged its environmental partners to come up with new ways of improving forest management in the country. PAGE's analysis of the sector found that efforts in the past had been focused almost exclusively on only two categories of actors: the State and donors. PAGE noted the relative absence of civil society in forest management decision-making and proceeded to propose a program for engaging a broader cross-section of the Malagasy civil society, including the private sector, associations, advocacy NGOs and others. PAGE proposed focusing on the critically important role of civil society in forest management, and on the potential for improved governance to bring out long-term forest management improvements. For a more complete discussion of this work, see the following pages.

For more information, contact Solohery Rakotovao, Ahmad Abdillah,
Françoise Ravaoarimalala or Holisoa Rasamoelina

Improving Forest Governance

PAGE developed its Forest Governance program with one overall goal: empower and engage the Malagasy public to play a more informed and active role in sustainable forest management, in particular in the areas of forest management transfer and the forest concession permitting process. Through our attempts to advance core "good governance" principles of accountability, transparency and participation, PAGE hopes to stimulate a more mutually beneficial relationship between the State (via the Ministry of Water and Forests) and its clients, the Malagasy public.

While forest laws currently allow for a considerable level of public participation in forest management, few members of the public have even the faintest understanding of what those laws say. And fewer still are aware of their civic responsibilities for good forest management. As of early 2000 when PAGE its program, there was not a single Malagasy NGO engaged in advocacy work concerning the country's forests. And the use of proven approaches such as social marketing for communicating forest rights and responsibilities had been virtually ignored.

In response to these needs, PAGE's forest governance program included four inter-related activities:

- (1) At the local level, develop and test appropriate tools for communicating forest rights and responsibilities, in particular concerning co-management of forests by communities and rights concerning forest permitting;
- (2) At the Provincial level, help define and put in place a civil society institution responsible for ensuring transparency, accountability and participation in forest management;
- (3) At the national level, assist the Ministry of Water and Forests (MEF) to develop (a) a new institutional orientation focused on the core principles of good governance and (b) a well-coordinated communication and outreach strategy; and,
- (4) Throughout the country, assist in the long-term institutional development of NGOs capable of being advocates for good forest governance.

So as to develop and test communication approaches, PAGE allocated \$100,000 of our grants funds to seven Malagasy NGOs to develop and test tools and approaches for communicating forest rights and responsibilities to local communities.

These communication efforts have focused on explaining the technical, legal and administrative steps involved in transfer of forest management to communities and on helping communities understand the forest use permitting process. Supported by PAGE's Specialist in Forest Communications, the NGOs have worked with local communities in sites including Ft. Dauphin, Fianarantsoa, Moramanga and Fenerive Est. At present, each of the NGOs has developed communication approaches and materials based on the needs of their particular clients. PAGE has worked to ensure that these local tests are conveyed for comment by the MEF staff, and that lessons learned by grantees in one region are transferred to other regions. In the coming phase, these NGOs will be testing the communication tools.



Puppet shows, one very creative communication tool developed by one of PAGE's grantees to inform local communities of their forest rights and obligations.

At two of PAGE's field sites -- in Bevilany near Fort Dauphin and Vavatenina near Fenerive Est -- we have developed a joint program with WWF's CAF/APN project in forest governance and community-based forest management. The partnership with WWF was established so that

PAGE's work on communication could be eventually integrated into WWF's efforts, and so that the PAGE grantees could benefit from the technical know-how of WWF's specialists in community-based forestry.

The second goal of PAGE's governance program is to put in place an institution at the Provincial level (in Tamatave and Tulear) that supports core principles of good governance, and in particular accountability, transparency and participation. The institution, which is to include members of the private sector, NGOs, associations, Provincial and national government, is to assist the MEF in ensuring good governance for the Province. Although the term "observatory" had been used by the MEF to describe this new Committee or institution, PAGE has recommended that the emphasis be placed instead on the concept of "stewardship". PAGE is now working in the regions of Tulear and Tamatave to put these institutions in place.



PAGE grantee KMF/CNOE leading a workshop in September 2001 on forest legal texts and communication techniques for PAGE's Ft. Dauphin grantees.

Enriched by the input from the PAGE grantees and by the work of putting Stewardship Committees in place, PAGE has begun an effort with the Ministry and its donor partners -- and in particular Conservation International -- to develop a more coherent and streamlined overall strategy for forest communication, with a particular emphasis on a more active engagement of the public. At present, we are working with the Ministry to put in place a Task Force consisting of the MEF and all the donors supporting forest communication. In mid-2001, an IRG forester provided a roadmap for re-orienting MEF as an institution so as to be more focused on core principles of good governance.

The long-run goal of our grant support to NGOs is to create a more active network of forest advocates in the country, and more generally a more active environmental civil society. To this end, a seventh grant was given to the National Committee for the Observation of Elections (CNOE), most commonly known for its election education work, but also interested in the environment because of its links to local governance and advocacy. CNOE, working with PAGE specialists, has provided a key role in supporting local NGOs with information and ideas, and also in ensuring that lessons learned on forest communication in one region of the country are transferred and available in others. The grant to CNOE offers potential not only to influence the other PAGE grantees, but indeed the entire network of CNOE affiliates throughout the country.

PAGE believes that the Malagasy public needs to be engaged in forest management, not so much on the grounds of their value as repositories for biodiversity, but because forests are essential to rural livelihoods and security. If citizens do not participate in decisions concerning use and allocation of forest resources, then it is likely that their fundamental needs will not be met.

Our forest governance program is modest, and does not represent a comprehensive effort to address forest governance issues in their entirety. It is an attempt to begin addressing issues that in our opinion have been under-emphasized by comparison with more scientific silvicultural solutions. Yet we believe that until and unless a broad range of civil society actors at the local and national levels become actively interested in and informed about the country's forests, technical solutions will not be enough.

For more information, contact Françoise Ravaoarimalala, Ahmad Abdillah
or Holisoa Rasamoelina

Supporting Strategic Planning at the Ministry of Environment

The Ministry of the Environment has recently made concerted efforts to provide leadership in the range of environmental activities undertaken by different parts of the Government. In May of 2000, the Ministry formally requested that PAGE assist them to undertake a broad-scale organizational capacity-building program. As a first step in this process, PAGE designed and led a two day strategic management planning exercise for the Minister, his key political advisors and senior ministry executives.

There are dozens of different models and processes that have been put forward for strategic planning. The vast majority of these attempt to force planners into constructs, which, unfortunately, have little to do with their operating realities. Since being able to share strategic concepts and visions is the essence of planning, PAGE opted to design a model for the Ministry that would be readily accessible and easily communicated.

The first priority was to work with the Ministry to identify a series of thrusts, or “axes d'intervention” in French. Breaking down what has to be done in this way provided a clear link between priorities and targets and created a roadmap to a simple monitoring and reporting system. It also provided implementers with an unequivocal direction concerning priorities.

Over the course of two days in May of 2000, PAGE worked with the Minister and his staff to translate their vision and mission into a series of strategic objectives and orientations, which then were clarified as core themes. Although the core themes have evolved slightly since their first presentation, they include the following general themes:

- The understanding by citizens of links between environment and development
- Management of soils and water
- Climate change and problems of the atmosphere
- Conservation of biological diversity
- Promotion of sustainable development
- Reduction of the impacts of poverty

One of the most important values of such a planning process was that it helped the Ministry to see that it cannot run the sector on its own. In its effort to be an effective leader, it had to develop a more concrete appreciation for the need to take advantage of the institutions already existing, in particular the National Environment Office (ONE), and to find synergies and ways of reaching common goals.

The two-day workshop on strategic planning was the first major step in a clarification of strategy for the Ministry. Since then, PAGE has proceeded to develop a core strategy with the Ministry, described in a draft document of some 40 pages.



PAGE leads an initial strategic planning session in May, 2000 with the Ministry of Environment, with active participation by the Minister (foreground left).

This core document has now become the focus of an expanding series of policy discussions and dialogue intended to build common understanding of the strategy, and to refine the strategy through feedback. In a first round of meetings held in October, 2001, PAGE worked with the Ministry to undertake an internal team-building exercise, at which the full Ministry staff assessed their own roles in light of the proposed document, and commented also on the overall proposed strategies for the Ministry as described in the document.



With an initial draft of the strategy completed in hand, PAGE works to gain feedback and build consensus among Ministry of Environment staff.

In an upcoming round of discussions and dialogue, the Ministry of the Environment will undertake a series of presentations to the four principle environmental agencies in the Environment Program, and then to other sectoral Ministries, to Provincial Governments and to the private sector.

The process is long, but the approach that PAGE has proposed for this strategic planning process has helped considerably in focusing Ministry efforts on the leadership role, and on putting its resources in juxtaposition to its sought targets. In the coming months, PAGE and the Ministry will continue working closely together to clarify precisely how the Ministry will achieve its vision of leading the environmental sector.

For more information, contact Solohery Rakotovao

Quantifying and Communicating the Economic Value of the Environment

Madagascar is one of twenty countries targeted for significant debt reduction from the World Bank. That reduction is contingent upon developing a clear program for reducing poverty. As Madagascar has moved forward in recent months to develop this program, one lesson has emerged clearly: environment is not perceived, at least amongst policy-makers, to have a direct relation to poverty.



Forests management and soil conservation interventions have direct impacts on the availability of water for economic development.

Yet environmental resources such as forests, soils, rivers, beaches, water, flora and fauna, provide many types of valuable services to the people of Madagascar and the rest of the world. To support economic development in Madagascar, economics logic suggests that these environmental resources should be allocated to their most beneficial or highest valued use. While it is accepted that the economic value of most goods and services is reflected in their market price, markets have often under valued many of the services provided by the protection and wise management of environmental resources.

Recognizing that this was the case nearly two years ago, and understanding that a better understanding was needed of the economic value of the environment, the National Environment Office (ONE), The Center for Training in GIS and Environment (CFSIGE), Cornell University, the University of Antananarivo and PAGE launched an environmental economic capacity-building and case study program. At the time the program was launched, the following objectives were identified:

- Provide quantitative estimates of the economic value of both marketed and non-marketed environmental goods and services;
- Train Malagasy analysts, governmental and non-governmental managers in the theory and methods used to undertake such quantitative estimation efforts.
- Support improved decision-making by providing quantified values of environmental goods and services in comparison with “marketed” goods and services.
- Communicate, to decision-makers and the general public, the contribution of the environment to economic development

To achieve these objectives, ten field-oriented case studies were launched to estimate the economic value of a wide range of natural resources. The studies apply recognized methodologies of environmental economics such as contingent valuation, change in revenue/productivity, and travel cost.

The case study managers, who are all Malagasy researchers with some prior training in economics and the environment, also participated in an intensive training course in August, 2000 to strengthen their understanding of the methodologies and principles of environmental economics. A well-known PAGE-funded international environmental economist was closely involved in the design of the training as well as at other critical points in the program.

At present, all of the ten reports have been completed and submitted to the ONE and the CFSIGE, and can be found in summary form as well as in their entirety at www.irgltd.mg. A strategy for communicating results to decision-makers and the public is under preparation. The case studies provide clear guidance for the continued use of such methods to support the future activities of governmental and non-governmental analysts.

A number of salient results have already emerged from the studies, some of them with direct implications for environmental management in the country. The case study focusing on willingness to pay to visit national parks has provided specific recommendations to ANGAP in revising their park entry fee policy, and has provided a range of values to fix the level of a proposed tourist "green tax" under discussion with the Ministry of the Environment.

The willingness to pay of the urban residents of Fianarantsoa -- estimated in "The Value of Urban Water Supply" -- is being used to guide discussions with the city's water utility on investments required to ensure water supply in the future. One low cost but feasible option for the utility may be to invest in forest protection in the water catchment area for the city, rather than invest in infrastructure to pipe in new sources of water.



Participants of the case studies presentation session in October 2001 break into groups to discuss individual

During the remainder of PAGE, the focus of our efforts will be on drawing from these studies to develop tools for communicating and making use of the study results.

For more information, contact Andy Keck or Philip J. DeCosse

The 10 Case Studies

1. Economic valuation of soil conservation activities
2. The value of non-timber forest products
3. The net benefits of wood fuels
4. The in-situ value of biodiversity
5. Estimating off-site costs of deforestation on irrigation infrastructure
6. The value of urban water supply
7. The value of tourism
8. The benefits of increasing water supply to rural households
9. In-home health risks from wood fuels
10. Estimating costs/benefits of carbon conservation

The study of the value of non-timber forest products showed that forest products in general accounted for roughly a quarter of household income on an annual basis (at the study site in Ambohitantely), with non-timber forest products accounting for 12 percent of household income in select seasons. Future options for expanding the use of forest management transfer to communities relies on a sound understanding of communities' current benefits, and this study provides a roadmap of how such estimates can be done.

The Government of Madagascar's Policy Framework Paper (1999-2001) calls for near-term improvements in the climate for domestic and external investment. The Environmental Program 2 (EP2) calls for close tracking of the legal and institutional context for investment to ensure that new projects are consistent with environmental protection and conservation goals. The most important set of regulations governing environmental aspects of investment in Madagascar is the MECIE Decree, a new version of which appeared on July 10, 2000 in the official Government Gazette. The MECIE Decree provides the legal framework for the conduct and submission of Environmental Impact Assessments (EIA) and Environmental Engagement Documents (essentially a less onerous version of an EIA).

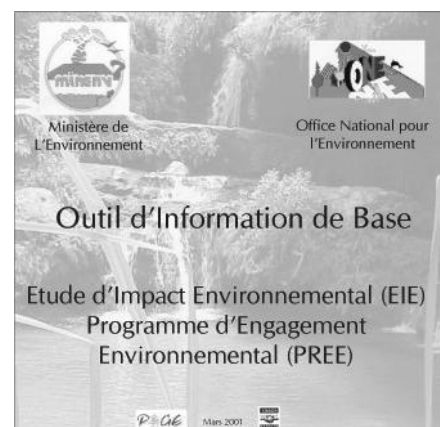
USAID has provided continued support to EIA development in recent years, in particular via its KEPEM project and during PAGE. KEPEM's efforts were successful in establishing a basic level of awareness of the MECIE Decree, particularly during the period 1995 to 1999. Nevertheless, in the nearly six years since the 1995 MECIE's passage, less than 75 EIAs have been undertaken and submitted to the Government for official review. Within certain sectors, awareness of the Decree has continued to be low. And even where investors are aware of it, the perceived complexity of the process – both institutional and technical – has served as an impediment to better application of the legislation.

In light of these conclusions, and additional assessments and interviews by PAGE, we chose in late 1999 to make it our highest priority to show that the EIA process can work, that it is not an undue burden on private industry, and that compliance with the EIA law is an important part of long-term economic development. So as not to be diffuse in our efforts, we also chose to focus primarily on the mining and tourism sectors. The priority areas of PAGE's EIA work have thus included the following:

Strategic Environmental Assessments (SEA) as a Tool for Facilitating Private Investment: Strategic Environmental Impact Assessments (SEA) are impact assessments that go beyond the narrowly defined limits of a single project. SEAs can cover a region, a sector, or a type of investment. PAGE is attempting too use SEAs to generate a clearer and simpler framework for private and public sector investors. See additional information on SEAs in the following pages.

An EIA Tracking System within the National Environment Office (ONE): PAGE has developed a computerized information system for tracking each of the EIAs submitted to the ONE. The Microsoft Access/Visual Basic software system automatically generates summary output reports ranging from financial allocation of ONE resources by EIA to the highlighting of delays in evaluation of EIAs.

Tools for Making EIA-related Information More Accessible: Private sector consultants and EIA evaluators have made it clear that basic reference information about EIAs, ranging from reference documents to spatial information, is difficult and expensive to find. To alleviate the constraint, PAGE prepared a CD-ROM with more than 150 megabytes of EIA-information on Madagascar. The information includes such things as samples of EIAs previously conducted and submitted to ONE, maps showing priority biodiversity conservation areas, and the three volume World Bank guidelines on environmental impact assessment.



This CD-ROM is one tool developed by PAGE, the Ministry of the Environment and the National Environment Office to make EIA-related information more accessible to all.

Communication Tools to Make the EIA More Comprehensible: Working with the ONE, PAGE developed generalized guidelines for conducting EIAs as well as sectoral EIA guidelines for aquaculture, roads, upstream oil development, and tourism. Posters and brochures have been developed to convey EIA information to investors, and a website (www.mecie.mg) has been established to convey information to investors and the public about EIA. Each of these tools makes it clearer to investors how they should organize and prepare an EIA for submission and review.

Support to Evaluation of the QMM Mining EIA: Because of the high profile of the proposed QMM mine in the Anosy Region in the southeast of the country, and the attention given to the review of QMM's EIA for the site, PAGE has supported the ONE in technical evaluation and public review of the EIA. For more information on this activity, see the following pages.

Capacity Building in EIA at the Provincial and National Level: PAGE has funded a broad capacity building effort to ensure that a cross section of EIA practitioners, inside and outside the Government, is capable of understanding and participating in the EIA process. We have funded training programs for conducting EIAs of local infrastructure investments and for training of environmental and sectoral agencies in the regions. We have undertaken training for some 90 members of Environmental Units in national ministries and institutions. And we have funded and provided technical oversight to the thesis research of 21 EIA degree students at CFSIGE focusing on either mining or tourism.

Computer Based Training Tools for the Mining Sector: Presently, there are more than 5,000 mining permit holders that are required to submit environmental "statements of conformity" with the MECIE Decree to the Ministry of Energy and Mines in the coming months. In response to this need, PAGE is developing a computerized software process in Malagasy and French that these permit holders can use at regional mining offices to report on the key environmental characteristics and impacts of their mining activities.

Assessment of Ecotoxicological Impacts of Locust Spraying: A PAGE-funded study in 2000 found that the current spraying regime of the locust eradication program has severe ecotoxicological impacts on select taxa, and that many of these impacts could be reduced by changes in the spraying regime. PAGE is now in the process of advising the Ministry of the Environment and the ONE on their options for addressing these environmental concerns.

Regional Environmental and Economic Impact Assessment of the FCE Railroad Privatization: PAGE's regional economic and environmental impact assessment of the FCE railroad privatization -- undertaken in close collaboration with the LDI project -- quantified the positive economic and environmental impacts of privatization, and helped expose the strong links between regular use of the railroad and impacts on forest loss.



This poster is one of the communication tools developed by PAGE and the National Environment Office.

For further info, contact Evah Andriamboavonjy or Philip J. DeCosse

Using Strategic Environmental Assessment (SEA) in the Mining and Tourism Sectors

EIA

Can the environmental impact assessment (EIA) process serve to assist Governments in managing environmental impacts while at the same time making private investment easier and cleaner? The Government's strategic environmental impact assessments (SEAs) of a special mining economic activity zone (ZAES) in Vatomandry and a 1,300 hectare Ecotourism Development Zone (ZIE) in Isalo are attempts to do just that.

In its policy reform program agreement ending in 2000, the Government committed itself to develop ZIE in five important ecological sites in the country. The ZIE furthest along in development is that one located next to Isalo National Park in the southwest, an arid zone of stark natural beauty and high endemic biodiversity. For the Isalo ZIE, a detailed management plan for the 1,300 hectares was completed in February 2000, including specific guidance for each of the hotel sites. Pursuant to completion of the plan, the Ministry of Tourism requested PAGE to finance and lead an SEA of it, and the SEA was completed in May, 2000. The National Environmental Office (ONE) reviewed and commented on the SEA in August 2000, and it has been since distributed to investors interested in bidding on one of the lots within the zone and placed on the web for review. Because of political problems between the Ministry of Tourism and the ONE and Ministry of the Environment, the SEA has not, however, been formally evaluated under the MECIE Decree, which governs procedures for all EIA.



Poorly sited and illegally placed buildings, like this one at Isalo, are difficult to remove once put in place.

In the mining sector, the use of SEA has gone further. A new SEA for the Vatomandry ZAES in the mining sector has already been submitted officially by the Ministry of Energy and Mines to the Ministry of the Environment. Work on this mining SEA was stimulated by an event in July of 2001, when the Ministry of the Environment officially informed the Ministry of Energy and Mines that the Special Economic Activity Zone (ZAES) it had designated for the Vatomandry region did not include a proper application of the MECIE Decree. The Ministry of Energy and Mines was given the options of: (1) asking each mining permit holder to undertake and pay for its own EIA, or; (2) undertaking a strategic environmental assessment (SEA) for the entire zone, and requiring each mining operator to conform to the approved environmental specifications in the SEA. Cognizant of the potential cost savings to its mining clients, the Ministry of Energy and Mines decided to undertake the second option, and submit an SEA for the entire region.

The Ministry then requested the technical and financial assistance of PAGE to conduct the study, and the SEA began in October of 2001. PAGE financed the participation of five key members of the SEA team, including the same international expert that had worked on the Isalo SEA a year earlier.

A fully constituted Technical Evaluation Committee chaired by the Director General of the Ministry of the Environment and including four other ministries has now begun review of the document, and has already made a field visit to the site.

The work on SEA for tourism in Isalo and mining in Vatomandry -- taken together -- are significant in three major ways. First, they represent the first applications of the requirement in the new MECIE Decree that all “policies, plans and programs with significant environmental impacts” conduct an EIA as per the requirements of the Decree. This puts Madagascar ahead of most developing countries, where although SEAs may be conducted, they are rarely formally evaluated under the law.

Second, the SEA can help to improve the upstream elements of development plans. In Isalo, the analysis behind the SEA played a direct role in eliminating 4 proposed lots within the ZIE, each of which would have

reduced the overall environmental quality of the zone and, most probably, its financial value as well. The Isalo SEA was also instrumental in raising awareness of the extent to which local populations had been marginalized during the development of the ZIE, and in urging the Ministry of Tourism to post a local facilitator and address community concerns directly.



Guidelines in the Vatomandry SEA can help mining operations like this one conform to international standards.

Third, the SEA efforts of PAGE have provided, and will continue to provide, a clear framework showing investors what they need to do to comply with environmental laws and regulations. One of the annexes of the Vatomandry mining SEA is a summary environmental checklist that each investor will need to complete in order to obtain permits for mining in the region. Such simplified checklists are considerably less onerous to investors than the conduct and financing of an entirely separate EIA. Similarly, one output of the tourism SEA in Isalo was a “Standard Environmental Form” which not only highlights the major environmental issues that each eco-lodge investor will need to address, but also links the elements of that form to information gathered and used in the strategic EIA itself.

Generally, the strategic environmental assessment (SEA) work of PAGE demonstrates that careful application of environmental laws and regulations can at the same time serve to make investment better for the environment and easier for investors.

For more information, contact Evah Andriamboavonjy or Philip J. DeCosse

Public Review and Environmental Evaluation of a \$345m Ilmenite Mine

EIA

For more than 10 years, QIT Madagascar Minerals S.A. (QMM, S.A.) has explored options for starting an ilmenite mine near the town of Fort Dauphin in the South of Madagascar. The mine, estimated to represent more than \$345m over 20 years for the first of three sites, provides a potentially significant boost to economic growth in a poor region of the country.

In spite of its potential economic benefits, the proposed mining investment has been the cause of debate and even conflict within Madagascar. Some international and national NGOs have argued that the mine will destroy some of the few remaining fragments of littoral forest in Madagascar, that social conflicts will arise as immigrants to the region conflict with locals, and that QMM should invest more in environmental conservation actions as an actor and partner in the region. Others have argued that such concerns are inconsequential when weighed against the economic benefits to the country and region.



The proposed mining site is located on degraded littoral forest with sandy soils.

QMM, for its part, has undertaken a considerable effort in addressing social and environmental concerns, the fruits of which are evident in the Environmental Impact Assessment (EIA) they submitted to the Ministry of the Environment on May 15, 2001.

Immediately upon submission, two parallel processes were launched to review the EIA. An official Technical Evaluation Committee (TEC) composed of some 19 different ministries began evaluating the document on its technical merits. The processes for constituting and running these TECs are quite clear for smaller investment projects, since they are explained in the MECIE Decree that

governs the EIA process. But for an investment of the size and importance of QMM's, the Government has had to clarify the rules for operation of the TEC.

At the same time as the technical review process started, a comprehensive public review process was launched -- the first of its kind in Madagascar. Soon after submission of the QMM EIA, the Ministry of the Environment released a detailed set of regulations outlining the public review process to be followed for all investments undergoing an EIA. Detailed manuals were proposed by the ONE for the Public Interviewers, and such manuals were closely examined and commented upon by QMM. With assistance from PAGE, the full text of the QMM EIA was made widely available to the domestic and international public via www.mecie.mg.

During the period May through October 2001, the Public Review Commission, working closely with the ONE, organized and oversaw public surveys in the eight Communes surrounding the proposed QMM site. At each of these surveys, QMM presented their project, and public opinions were carefully registered and recorded. Just after completion of the public surveys, three large Public Audiences were organized in Antananarivo, Tulear, and Fort. Dauphin, at which more than 2,000 citizens attended. The Chairman of the Commission moderated the Audiences, at times having to strongly assert his control of the meetings.

On November 14, 2001, after much negotiation, the Ministry of the Environment released the Government's final decision to award an environmental permit to QMM. The permit comes with conditions that are spelled out in detail in an Environmental Management Plan of 117 pages.

PAGE has provided technical advice concerning the ilmenite mine EIA to the Ministry and the National Environment Office (ONE) intermittently during the past two years and intensively during the period from May to November of 2001. Overall, USAID's direct support since the submission of the EIA has focused on both the public review process and the technical evaluation process. Via a partnership with the US Forest Service (USFS) and with the help of coordination by PAGE, USAID has also provided advice on the forest regeneration proposals of the QMM EIA. In a related area, PAGE has provided technical support to a Regional Development Committee as it has prepared a set of development priorities for the Anosy Region where the mine is to be located.

It is now quite clear that USAID's input via PAGE (and other partners such as USFS) has had an impact on the final form of the QMM proposal, as included in their management plan. Although the exact nature and extent of that impact is still being evaluated, USAID and PAGE input certainly had an impact on the following areas:

The Public Review Process: At the beginning of the process, PAGE provided intensive training in international best practices for conducting public reviews and encouraging public participation on review of complex EIAs like this one. The guidelines proposed in those training sessions have served as a base for the remainder of the process. And as the Public Review has proceeded, PAGE provided detailed commentary and suggestions not only for conduct of the review process, but also for structuring and format of final reports of the Commission. As a partial result of these efforts, the process will offer important lessons for the conduct of public reviews, not just for large mines but for smaller mines and projects in other sectors also.



A dam proposed near here has become one of the key controversial issues in the evaluation.

Siting and Characteristics of the Proposed Dam: PAGE took the position that there were a number of important concerns with the siting of the proposed dam near the mine. The long-term viability of the estuary as a fresh water system was called into question, as was the possible risk of water-borne diseases that might follow. This issue has been extensively discussed by QMM and the Government, and responses by QMM to these issues form an important part of the Environmental Management Plan.

Forest Regeneration: The quality of protocols for generating, or regenerating, forests on the mining site were called into question by the US Forest Service, and then reiterated and presented to the Technical Evaluation Committee by PAGE. As the discussions between QMM and the Government have progressed, it has remained a priority issue to the Government that such protocols be clarified and improved. The final QMM environmental management plan includes extensive responses to the forest regeneration concerns.

USAID's support to the process, via PAGE and the USFS, is likely to reap benefits for the region and the country as QMM proceeds with developing their project financial and technical feasibility documents. And lessons learned during the conduct of such a large-scale public participation and review process will certainly be useful for USAID's broader goal of encouraging improved democracy and governance in the country.

For more information, contact Evah Andriamboavonjy or Philip J. DeCosse

Evaluating the impacts of programs on ecological systems, and on biodiversity in particular, is notoriously difficult. Biodiversity itself is difficult to define and measure. Biodiversity survey results are difficult to understand and interpret. And it is often difficult to convince leaders of development programs of the need for including measures of their impacts on biodiversity in the first place.

In spite of the challenges to monitoring and measuring ecological impacts, it remains an urgent priority. The various partners of the Environment Program (EP) have spent hundreds of millions of dollars in the past decade to improve management of the country's environment. Without a credible answer to the question -- Has the money been well spent so far? -- future funding will be increasingly difficult to obtain and justify. Equally important is the assurance that approaches and methodologies are understood and in place so that future programmatic activities can be assessed in light of their impacts on ecological systems, and particularly the biodiversity that distinguishes Madagascar as a "hotspot".

PAGE's Ecological Monitoring Program has placed a priority on ensuring that knowledge of the distribution, value and relative importance of the endemic biodiversity of Madagascar is incorporated into decision-making by EP actors. We have channelled our attention and resources to work with three sets of actors: (1) USAID, for whom we have been bringing technical support on evaluating their impact on biodiversity; (2) the executing agencies of the EP, with whom we have worked to improve accessibility, comprehensibility and relevance of biodiversity data; and (3) Malagasy students and local communities, with whom we have worked to improve the level of knowledge of biodiversity monitoring.



Figure 53. Giant Jumping Rat.

Madagascar's Giant Jumping Rat was identified as a conservation priority at the CAMP workshop.

Here is a sampling of the activities we have undertaken:

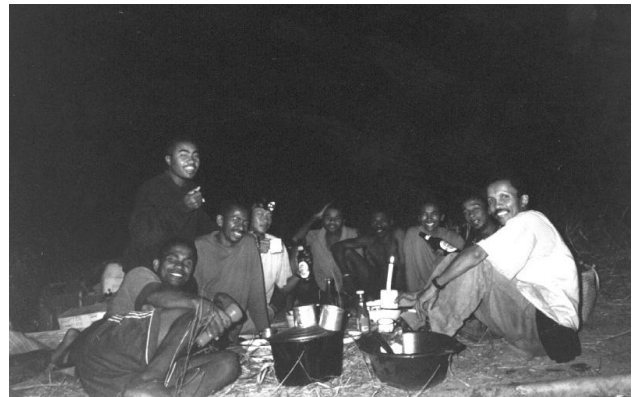
Measuring Rates of Loss of Primary Forest for USAID and the EP: For USAID and the EP, we have worked on evaluating rates of primary forest cover loss in priority areas, using the best techniques and data available, in order that the effectiveness of different environmental management strategies can be judged. We compared the rates of primary forest cover loss in two USAID and EP priority zones during the period 1993-2000, and then compared that rate of loss to a control zone. The study, among the first to use detailed statistical estimation techniques and a sound methodology for ground-truthing, has shown that rates of forest loss are significantly slower in the two USAID and EP priority zones than in the control zone. See additional information on the following pages.

Support to Definition and Measurement of an Indicator of Biodiversity Conservation: The EP proceeded for ten full years without a scientifically validated indicator of change in biodiversity status. The PAGE team provided scientific analysis calling into question a proposed "endemism" indicator and proposed instead a biodiversity indicator focused on change in three priority habitats. Because primary forests are the most important repository for biodiversity in Madagascar, the proposed indicator focuses on measuring rates of loss of forest cover in the following three forest categories: (1) low altitude humid forests (under 800 meters), (2) the western dry forests, and (3) the southern spiny forests. PAGE worked with the ONE to compile a comprehensive list of all the studies conducted to date covering these three

categories of forests, and is now in the process of providing technical support to the analysis of these studies and the generation of a first measure for the indicator.

Support to Conservation Management and Monitoring at ANGAP: The PAGE-supported Conservation and Action Management Plan (CAMP) workshop in May 2001 helped identify priorities for conservation in protected areas. This and other analyses of critical habitats and successful monitoring methods will contribute significantly to the development of a conservation management and monitoring system for ANGAP, a related technical area in which we have been providing advice.

The Role of Biodiversity "Watchdog" for USAID Investments: PAGE has also worked hard to ensure that biodiversity conservation initiatives supported by USAID are concentrated in the areas and habitats that are most important. After discussion about dropping the Mahajanga region as a priority zone for USAID, PAGE suggested that a better understanding of the biodiversity importance of the Bongolava forest should be a prerequisite to final USAID decisions about resource allocation. The latest phase of this work was recently completed, and resulted in identification of a number of key threatened species in the region. Over the last two years we have supported a number of other inventories and research efforts in areas of relevance to USAID programming.



The team of Malagasy biologists during the biodiversity inventory of the Bongolava forest

Development of Methodologies for Setting Biodiversity Conservation Priorities: The PAGE team initially developed a simple methodology for setting biodiversity conservation priorities for use in the Regional Develop Plan for the Anosy region in southern Madagascar. After the success of these efforts, an adaptation of the same method was launched in the important Ranomafana-Andrigitra and Moramanga-Zahamena Corridors. For further information, see the following pages.

Integrating Biodiversity Data into a Conservation Planning Platform: It was apparent in the early stages of PAGE implementation that core information about biodiversity was scarcely accessible to planners and researchers. PAGE teamed up with the Wildlife Conservation Society (WCS) and Princeton University to begin integrating already existing biodiversity data in an integrated planning platform, which we call the Biodiversity Analysis Platform. To date, some 50,000 biodiversity records have been included in the Platform, with approximately half of these being repatriated from such places as England, France and the United States. For more information, see the following pages.

Building Malagasy Capacity to Lead Ecological Monitoring Efforts: The Bongolava study, like other studies conducted with PAGE financing, have been predominantly led and managed by local technicians. We have supported numerous students in their thesis work, and ensured wider discussion of ecological monitoring issues by supporting local community groups in discussion workshops. Finally, we have opened up a dialogue with local communities living next to forests of high conservation value to assess whether mutually comprehensible monitoring indicators can be developed for critical forests and biodiversity resources.

For more information, please see Frank Hawkins or Luciano Andriamaro

Helping USAID Measure its Impact on the Rate of Forest Loss

USAID's support to the Environment Program (EP) runs into millions of dollars a year. Under USAID's Strategic Objective No. 3 -- "Biologically Diverse Ecosystems Conserved in Priority Conservation Zones" -- a broad set of activities is aimed at reducing forest loss from shifting agriculture. One of USAID's key indicators of program success focuses on this rate of forest loss.

While estimates of forest loss in Madagascar have been made on repeated occasions during the past twenty years, not a single one of these studies include all five of the following important characteristics: (1) measures of statistical precision (confidence intervals) for the estimated rates of change; (2) large enough scale to correct for the "noise" of a single project or a small number of projects; (3) measurement across significant areas of pre-defined USAID impact zones; (4) measurement of rates of change in primary natural forests (where the predominance of biodiversity is found); and (5) inclusion of a control zone.

The PAGE-supported activity measuring forest cover change address all five of these issues simultaneously. The study used Landsat imagery to compare primary forest loss in the period between 1993/1994 and 1999/2000. Forest cover change was measured in significant blocks (more than 7,000 square kilometers in all) of the forest corridors of the Fianarantsoa and Tamatave eco-regions. The corridors included were those between the Zahamena and Mantadia National Parks and that between the Ranomafana and Andringitra National Parks. Another corridor of more than 2,000 square kilometers at Anosibe an'ala was also measured as a control.

The study design allows for an assessment of Environment Program (EP) impact as well as USAID impact, since the two USAID priority regions were also EP priority regions during the period, while the control region was also not a priority region for the EP.

While the results of the study has not yet been improved through the addition of field measurements, the satellite data results demonstrate that the rate of forest loss in the seven years from 1993 to 2000 was slower inside USAID and EP priority zones than outside those priority zones. And study results also show that this lower rate of forest loss in USAID priority regions is statistically lower than the rate of loss in the non-priority control region.

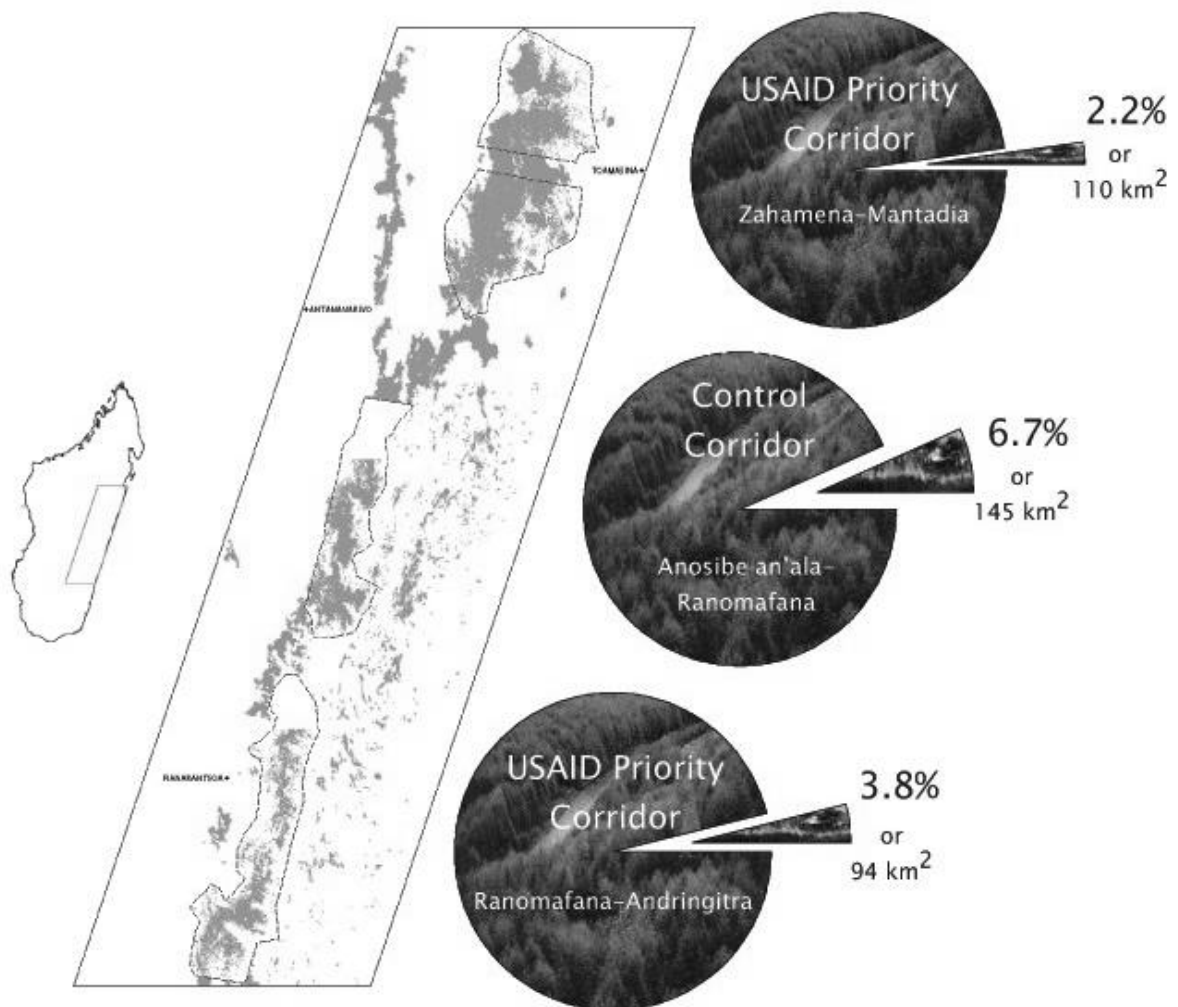
At the time of writing of this report, the ground-truthing data collection exercise has been completed for all three of the study zones -- in a joint effort of PAGE and the National Environment Office (ONE) -- with some 500 geo-referenced data points being prepared for use in updating the estimates included here. While PAGE does not expect a significant change in rates of change, such ground-truthing is an important step in providing accurate results, and in improving the accuracy of any future satellite forest cover studies.

PAGE is currently in discussions with Conservation International (CI) about the use of these ground-truthing data points by CI for the validation and checking of forest cover change maps they are preparing for the entire country.

So as to better communicate the results from this important study, PAGE is also in the process of preparing two large-size posters with the key results of the study.

**Estimate of Loss of Forest in Three Corridors in
Eastern Madagascar 1993/1994–1999/2000**

		Area of forest remaining in 1999/2000	Area of forest lost 1993/1994–1999/2000	Percentage forest lost 1993/1994–1999/2000
USAID and EP Priority corridors	Zahamena–Mantadia corridor	4,873 km ²	108 km ²	2.2%
	Ranomafana–Andringitra corridor	2,383 km ²	94 km ²	3.8%
Control corridor	Anosibe an'ala–Ranomafana corridor	2,022 km ²	145 km ²	6.7%

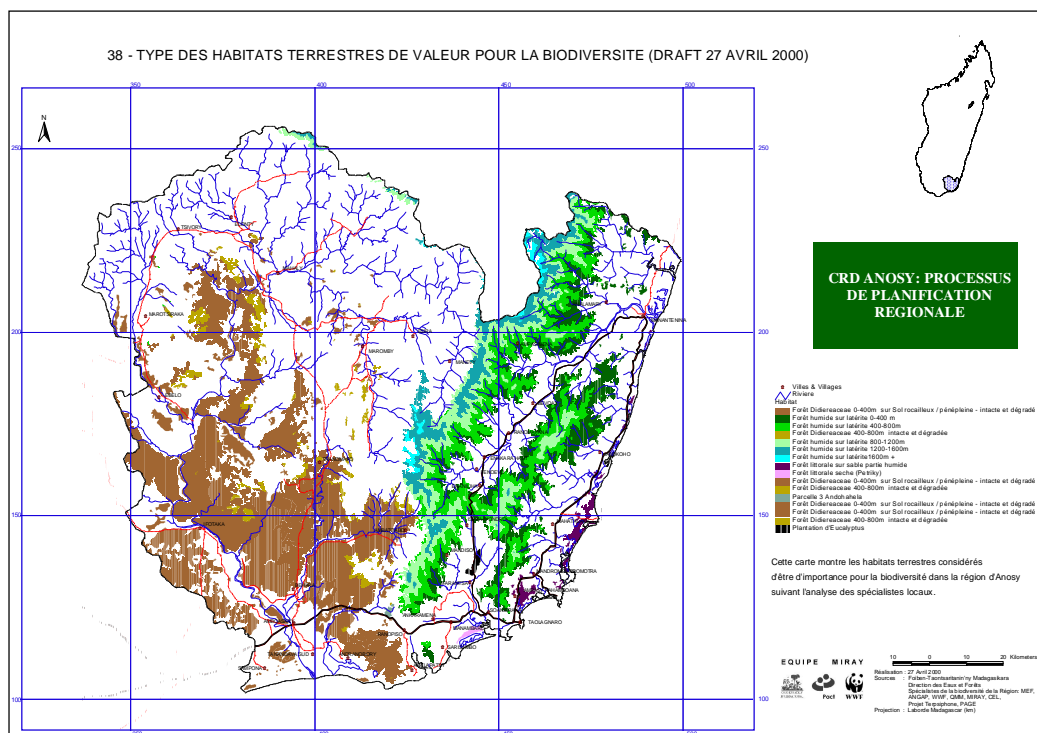


For more information, contact Frank Hawkins or Luciano Andriamaro

A Methodology for Setting Biodiversity Conservation Priorities

PAGE is working in three USAID priority regions of Madagascar to help local biodiversity specialists define priorities for conservation investment. In the Anosy region, the recommendations have already been integrated into the Regional Development Framework (SDR), and the lessons of this exercise have been synthesized and developed into a manual for more widespread application. In the Moramanga and Fianarantsoa corridor zones, two other regions of primary importance to USAID, PAGE is adapting the methodology to suit local conditions and capacity. PAGE has also worked to integrate other data-management and analysis tools into the priority setting process, in order that local specialists and decision-makers have access to updated and interpretable analyses for future priority-setting.

The Anosy region of southeastern Madagascar contains a variety of important habitats for biodiversity, including rainforest, spiny forest and freshwater ecosystems. Since 1990, it has also been the subject of intense debate about the proposed exploitation of a rich ilmenite deposit along the coast (see information about PAGE work on QMM EIA elsewhere in this report). This level of industrial investment is orders of magnitude greater than anything else in the region. In order for the potential investment to be undertaken in harmony with regional development needs, the region has developed a Regional Development Framework (SDR), under the leadership of a Regional Development Committee (CRD).



Map of habitats important for biodiversity in the Anosy region.

The CRD has asked PAGE to help in the integration of biodiversity priorities into the SDR. This we have done in two ways. First, PAGE gave a grant to the National Environment Office, which has led a synthesis of environmental opportunities and constraints (especially concerning water, forests, marine resources and soils).

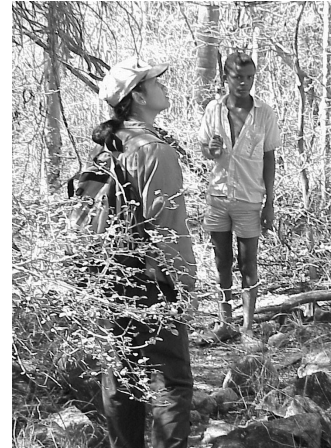
Second, we have supported a group of local biodiversity specialists to identify biodiversity conservation priorities for the area. Following the request from the CRD, the PAGE team contacted biodiversity specialists living in the Anosy region. A workshop was then convened, at

which the habitats existing in the Anosy region were identified. For each of eight taxonomic groups, the relative priority for biodiversity conservation of each habitat was then compared. In total, 31 habitats were identified, of which 15 or so are shown on the accompanying map. The team then divided the habitats into seven groups according to priority. The highest priority group consisted of the rainforest habitats (green on the map), while the second-highest contained largely dry and spiny forest (brown on the map).

In order that biodiversity conservation investment can be weighed against other potential uses of the biodiversity-rich forests, the team then had to decide on the most important sites within each forest habitat. To do this, nine criteria were drawn up for the selection of sites. Those criteria were then applied these to the blocks of forest left. The result was a map showing the most important areas within each habitat zone for biodiversity conservation.

The team also identified small areas of habitat of high value for biodiversity, as well as habitats and communes within the region where research is required in order to confirm inferences about habitat priority and quality. A supplementary analysis of biodiversity value of marine habitats was undertaken and a separate map showing the results was produced.

The overall set of products include: maps showing natural habitats present in the Anosy region; priority habitats; recommendations for management of key core biodiversity sites and corridors; sites holding special habitats or threatened, locally endemic or important species, and, priorities for marine biodiversity conservation. These analyses are now being used as the basis for biodiversity conservation investment calculations by economists working in the region, and in the development of the overall investment options model.



Luciano Andriamaro of PAGE in a dry forest of Anosy region



PAGE works with participants at a priority-setting workshop.

region. Secondly, the methodology used is scientifically robust and based on real data. The overall method and analysis are in the process of being prepared for publication in peer-reviewed journals, a testimony to the extent to which PAGE attempts to situate this work in the context of international best practices.

And the approach developed for Anosy is now be adapted for use in the Fianarantsoa and Moramanga regions. Results of a planning workshop in Moramanga (for the critical Zahamena-Mantadia forest corridor) are now completed, with biodiversity priorities evaluated using the PAGE methodology. In Fianarantsoa, the Biodiversity Analysis Platform (see following pages) is being included in the methodology to produce analyses which will make the process of priority setting easier and more robust.

Several features of this process are noteworthy from the application in the Anosy region. First, the outputs of the analysis were the product of local experts rather than people from outside the

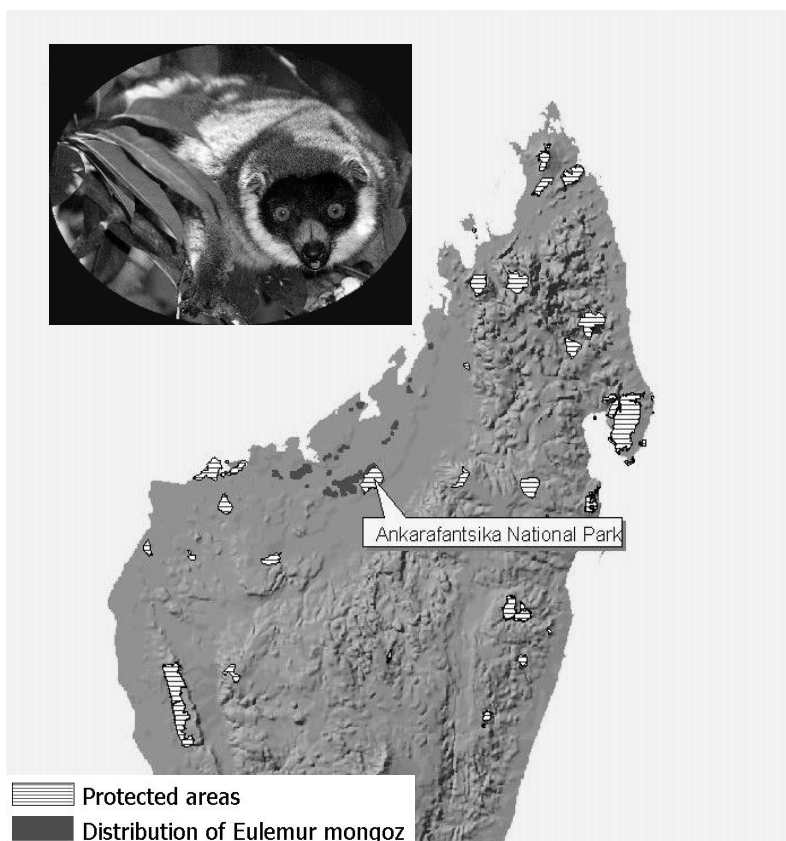
For more information, contact Frank Hawkins or Luciano Andriamaro

Integrating Biodiversity Data into a Conservation Planning Platform

A frequent complaint from decision-makers in Madagascar is that biodiversity data is next to useless for planning because it is too difficult to access, too technical, too point-specific and not relevant to any local social or economic issues. PAGE has attempted to address each of these criticisms through the development of the Biodiversity Analysis Platform.

Priority-setting for biodiversity conservation, described on the previous pages, enables biodiversity specialists to synthesize their views into a spatial format that is easily integrated into regional planning tools. However in many parts of the country there have been so many studies and inventories that it is very difficult to depend entirely on the accumulated knowledge of specialists.

The Platform is a combination of spatially-located biodiversity data and a set of powerful analysis tools that permit biodiversity specialists, projects and advisors to be sure that they have taken account of all the biodiversity issues in making their analyses. The biodiversity data set comes from all known formally published sources on many of the most important taxa for biodiversity planning: mammals, birds, fish, butterflies, some plants, some reptiles and amphibians, and some other insects. Some informally published and unpublished sources are also integrated. In addition, PAGE has supported many biodiversity inventory missions in USAID priority zones, leading to a better understanding of key habitats and species for areas and taxa that had previously been neglected. Included among examples of these inventories are studies of the biodiversity value and critical size of forest fragments, studies of the importance of wetlands and of the importance of forests outside protected areas, and studies of forests within priority areas for which no data exist.



Distribution of *Eulemur mongoz* with respect to the Protected Areas Network. The lemur's range is predominantly outside any existing protected areas.

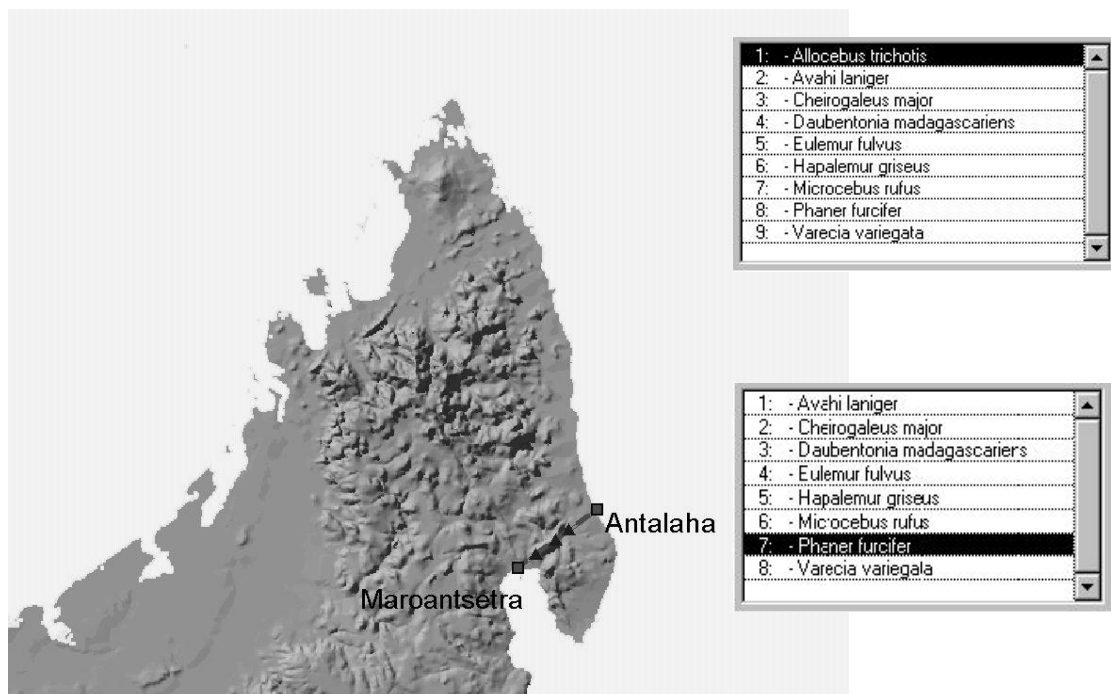
At present, the Platform now includes some 50,000 records, of which more than half represent biodiversity research data repatriated to Madagascar from a range of museums and research centers in Europe and the United States. Among the list the Chicago Museum of Natural History, the Royal Botanical Gardens (Kew), and the Missouri Botanical Gardens.

Developed via a close public-private collaboration of PAGE, the Wildlife Conservation Society (WCS), Princeton University (via Dr. Claire Kremen), and, more recently, PACT/Madagascar, the Platform represents an excellent example of public-private partnerships being brought to bear to solve technical and institutional challenges to improving development. Apart from

financing the Platform work, PAGE has played the role of broker and go-between with the numerous national counterparts interested in the effort. The WCS, as both a scientific and implementing environmental NGO -- and one with a long-term presence in Madagascar -- provides the national foothold for a long-term development of the tool. Princeton University's Dr. Kremen has provided support to the process from the beginning (while she was still at Stanford University) and offers intellectual leadership and a close relationship with numerous biodiversity research centers around the world. Finally, PACT/Madagascar offers an information management capacity as well as links to regional planning efforts here in Madagascar, particularly in the Fianarantsoa area where the Platform is now being applied.

The data are managed in a format that enables the Platform's powerful analysis toolset to:

- Identify key centers of endemism or species richness across taxa;
- Make predictions about key species' range;
- Compare planning applications against sites of biodiversity importance; and
- Identify biodiversity conservation investment potential, for instance for ecotourism or conservation concessions..



The Platform is used here to generate lists of species likely to be impacted by a proposed road between Antalaha and Maroantsetra.

The first proper test of the Platform will be at the Fianarantsoa corridor biodiversity priority setting exercise in February 2002, when the Platform will be used to help local biodiversity specialists to identify habitats and evaluate them against biodiversity criteria. The Platform will also list them in conservation priority order, group key habitats spatially, identify unknown or poorly known habitats or sites, and estimate ranges for threatened or important species. These analyses will be integrated with the PAGE forest cover change in priority area analysis to propose priorities for future biodiversity conservation investment.

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